# User Manual

# 5K/6K Online UPS

Uninterruptible Power Supply System

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# 1. Important Safety Warning

Please comply with all warnings and operating instructions in this manual strictly. Save this manual properly and read carefully the following instructions before installing the unit. Do not operate this unit before reading through all safety information and operating instructions carefully.

## 1-1. Transportation

- Please transport the UPS system only in the original package to protect against shock and impact.

## 1-2. Preparation

- Condensation may occur if the UPS system is moved directly from cold to warm environment. The UPS system must be absolutely dry before being installed. Please allow at least two hours for the UPS system to acclimate the environment.
- Do not install the UPS system near water or in moist environments.
- Do not install the UPS system where it would be exposed to direct sunlight or near heater.
- Do not block ventilation holes in the UPS housing.

## 1-3. Installation

- Do not connect appliances or devices which would overload the UPS system (e.g. laser printers) to the UPS output sockets.
- Place cables in such a way that no one can step on or trip over them.
- Do not connect domestic appliances such as hair dryers to UPS output sockets.
- The UPS can be operated by any individuals with no previous experience.
- Connect the UPS system only to an earthed shockproof outlet which must be easily accessible and close to the UPS system.
- Please use only VDE-tested, CE-marked mains cable (e.g. the mains cable of your computer) to connect the UPS system to the building wiring outlet (shockproof outlet).
- Please use only VDE-tested, CE-marked power cables to connect the loads to the UPS system.
- When installing the equipment, it should ensure that the sum of the leakage current of the UPS and the connected devices does not exceed 3.5mA.

## 1-4. Operation

- Do not disconnect the mains cable on the UPS system or the building wiring outlet (shockproof socket outlet) during operations since this would cancel the protective earthing of the UPS system and of all connected loads.
- The UPS system features its own, internal current source (batteries). The UPS output sockets or output terminals block may be electrically live even if the UPS system is not connected to the building wiring outlet.
- In order to fully disconnect the UPS system, first press the OFF/Enter button to disconnect the mains.
- Prevent no fluids or other foreign objects from inside of the UPS system.

## 1-5. Maintenance, service and faults

- The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.
- **Caution -** risk of electric shock. Even after the unit is disconnected from the mains (building wiring outlet), components inside the UPS system are still connected to the battery and electrically live and dangerous.
- Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals of high capability capacitor such as BUS-capacitors.
- Only persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorized persons must be kept well away from the batteries.
- **Caution -** risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present!
- Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:
  - remove wristwatches, rings and other metal objects
  - use only tools with insulated grips and handles.
- When changing batteries, install the same number and same type of batteries.
- Do not attempt to dispose of batteries by burning them. This could cause battery explosion.
- Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.
- Please replace the fuse only with the same type and amperage in order to avoid fire hazards.
- Do not dismantle the UPS system.

## 2. Installation and setup

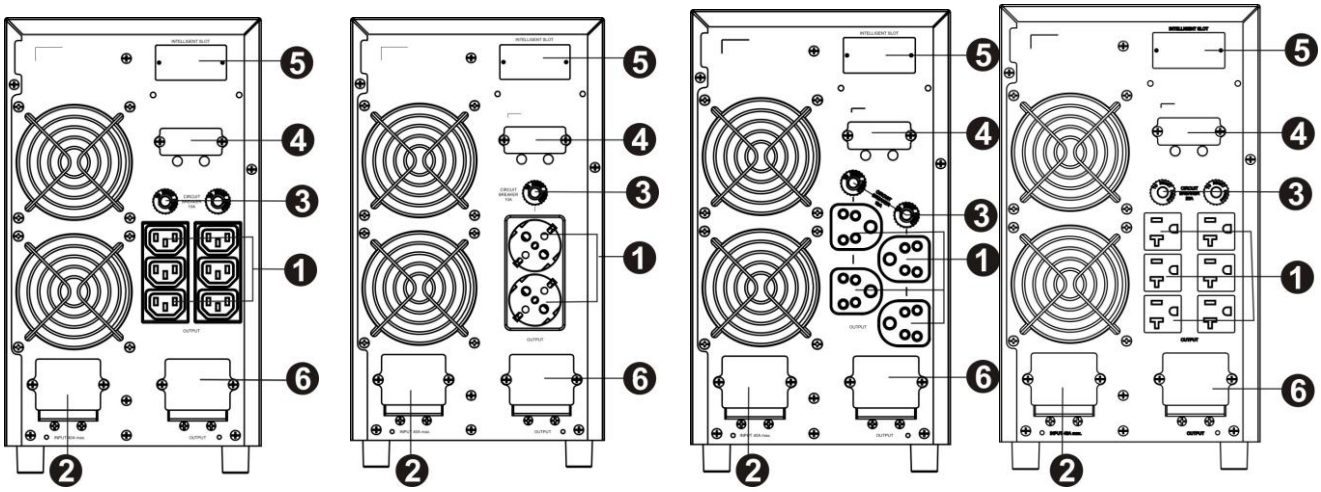
**NOTE:** Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. Please keep the original package in a safe place for future use.

**NOTE:** There are two different types of online UPS: standard and long-run models.

**NOTE:** When the UPS is equipped with isolation transformer, the model will simply be added "ISO".

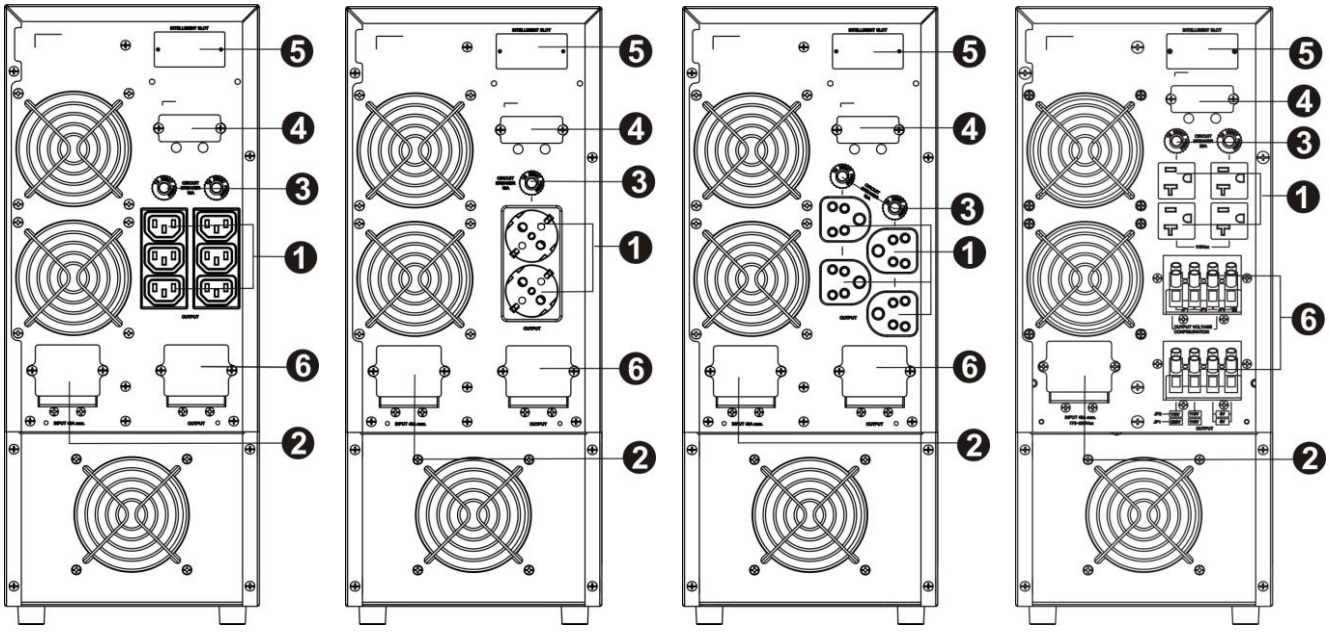
### 2-1. Rear panel view

**5K/6K tower case**



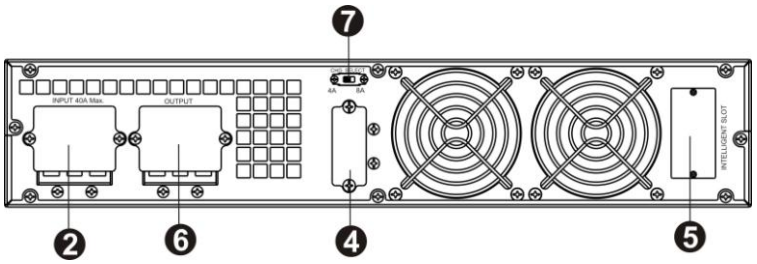

**IEC Type** **Schuko Type** **India Type** **NEMA Type**

**5KISO (with isolation transformer)**




**IEC Type** **Schuko Type** **India Type** **NEMA Type**

**5K/6K rack case**




1. Output receptacles
2. AC input
3. Circuit breaker for output receptacles
4. External battery connection (only available for L model)
5. Intelligent slot
6. Output terminal
7. Charger current selector

## 2-2. Setup the UPS

### Step 1: UPS input connection

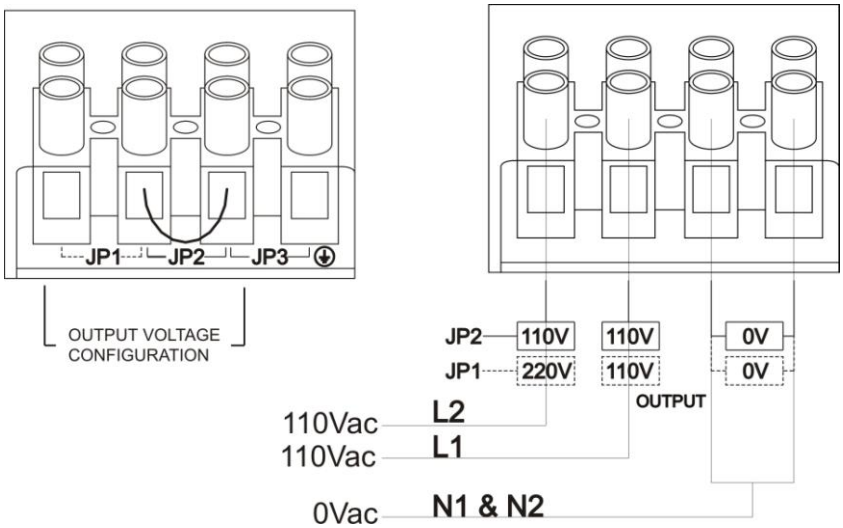
Plug the UPS into a two-pole, three-wire, and grounded receptacle only. Please do not use extension cords. The input plug is #12*3C.

### Step 2: UPS output connection

Simply plug devices to output sockets. During power failure, UPS will provide power to connected devices.

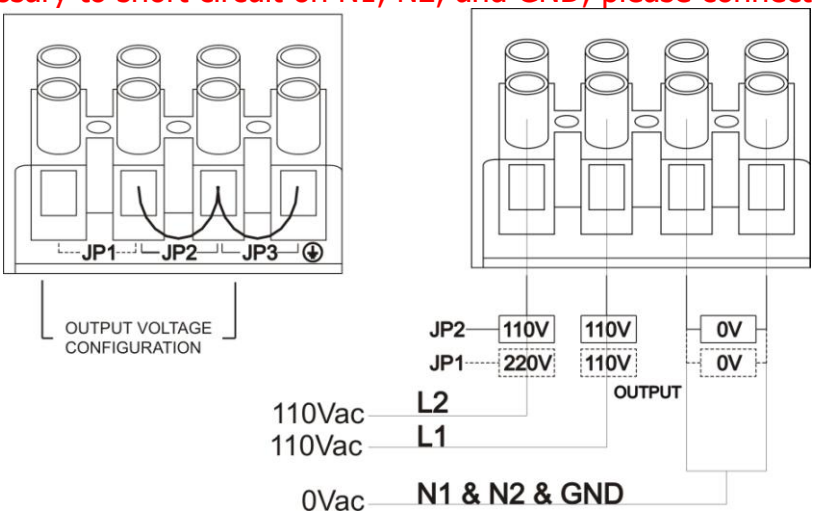
For 5KISO model with NEMA output type, please follow below steps for output configuration.

**Option 1:**

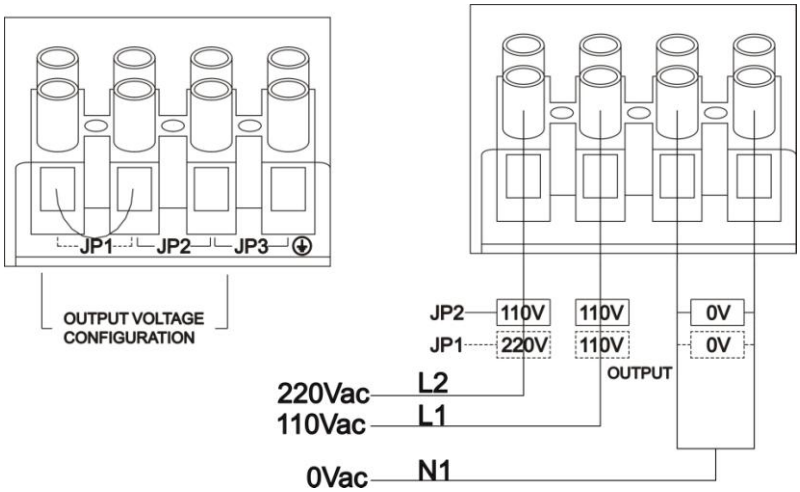



After connecting JP2, it becomes 2 sets of low-voltage outputs (104/110/115/120VAC) on L1-N1 & L2-N2. Each set is able to provide 50% of UPS rating power. Connect one load to L1-N1 and the other load to L2-N2.

NOTE: If it's necessary to short circuit on N1, N2, and GND, please connect JP3 as below:




**Option 2:**

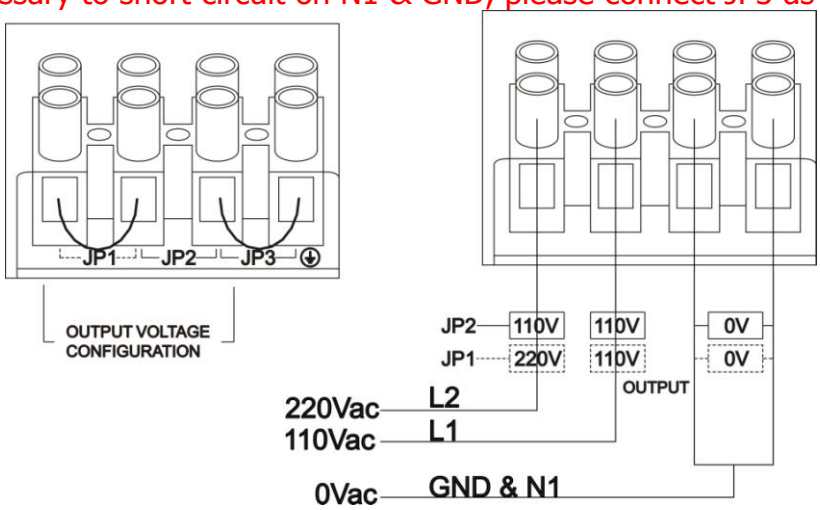



After connecting JP1, it becomes two outputs, one low-voltage output (104/110/115/120 VAC) at N1-L1 and another high-voltage output (208/220/230/240 VAC) at N1-L2. However, the current limitation is 25A maximum at N1-L1 and N1-L2. You must connect the load under the limitation. Connect low-voltage load to N1-L1 and connect high-voltage load to N1-L2. Please follow below current distortion formula when connecting to low-voltage and high-voltage loads at the same time.

$$I_{\text{high-voltage}} = 25A - I_{\text{low-voltage}}$$

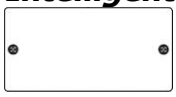
$I_{\text{high-voltage}}$ : High voltage current $I_{\text{low-voltage}}$: Low voltage current

NOTE: If it's necessary to short circuit on N1 & GND, please connect JP3 as below.

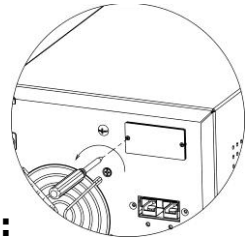


**Step 3: Communication connection**

***Intelligent slot***

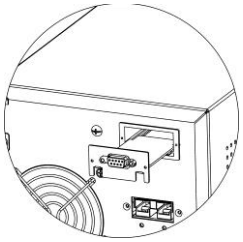


This model is equipped with intelligent slot perfect for SNMP, RS-232, USB or AS-400 card. When installing with these communication card in the UPS, it will provide advanced communication and monitoring options.



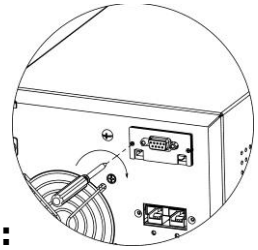
**Step 1:**

Remove cover of intelligent slot.



**Step 2:**

Insert communication card into the slot



**Step 3:**

Screw card tightly and complete installation.

**Step 4: Turn on the UPS**

Press the ON/Mute button on the front panel for two seconds to power on the UPS.

Note: The battery charges fully during the first five hours of normal operation. Do not expect full battery run capability during this initial charge period.

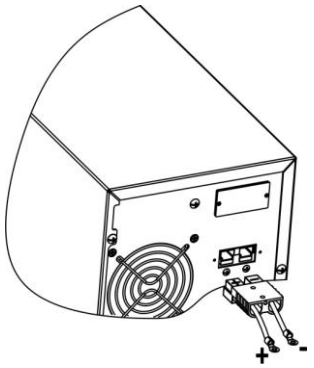
**Step 5: Install software**

For optimal computer system protection, install UPS monitoring software to fully configure UPS shutdown. You may insert provided CD into CD-ROM to install the monitoring software. If not, please follow steps below to download and install monitoring software from the internet:

1. Go to the website **http://www.power-software-download.com**
2. Click ViewPower software icon and then choose your required OS to download the software.
3. Follow the on-screen instructions to install the software.
4. When your computer restarts, the monitoring software will appear as an orange plug icon located in the system tray, near the clock.

**Step 6: External battery connection**

Follow the below chart to make external battery connection.



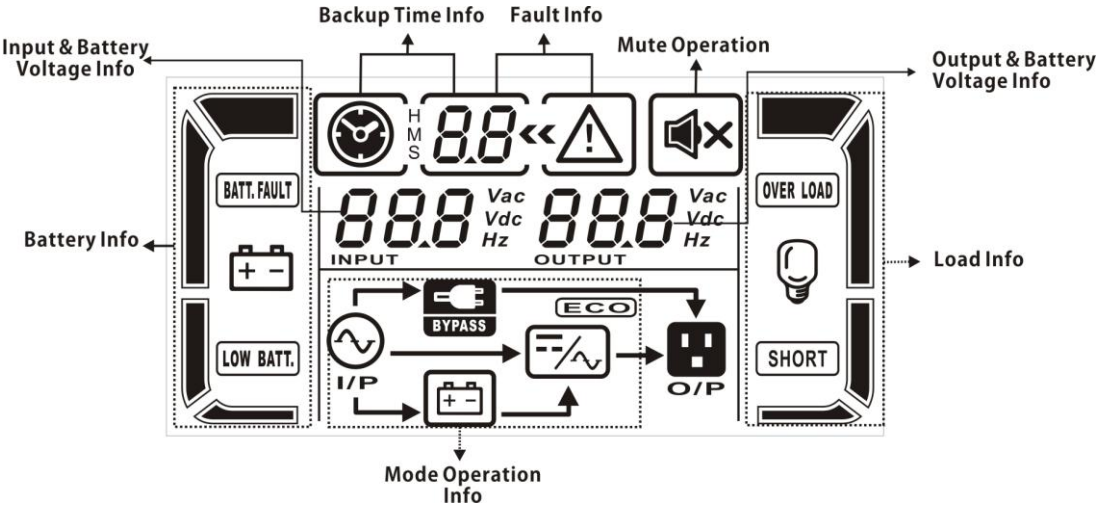

To external battery

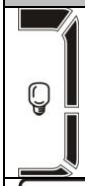
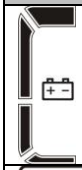
# 3. Operations

## 3-1. Button operation

| Button | Function |
|---|---|
| ON/Mute Button | ➢ Turn on the UPS: Press and hold ON/Mute button for at least 2 seconds to turn on the UPS.<br>➢ Mute the alarm: After the UPS is turned on in battery mode, press and hold this button for at least 5 seconds to disable or enable the alarm system. But it's not applied to the situations when warnings or errors occur.<br>➢ Down key: Press this button to display previous selection in UPS setting mode.<br>➢ Switch to UPS self-test mode: Press ON/Mute buttons simultaneously for 5 seconds to enter UPS self-testing while in AC mode. |
| OFF/Enter Button | ➢ Turn off the UPS: Press and hold this button at least 2 seconds to turn off the UPS in battery mode. UPS will be in standby mode under power normal or transfer to Bypass mode if the Bypass enable setting by pressing this button.<br>➢ Confirm selection key: Press this button to confirm selection in UPS setting mode. |
| Select Button | ➢ Switch LCD message: Press this button to change the LCD message for input voltage, input frequency, battery voltage, output voltage and output frequency. It will return back to default display when pausing for 10 seconds.<br>➢ Setting mode: Press and hold this button for 5 seconds to enter UPS setting mode when UPS is in standby mode or bypass mode.<br>➢ Up key: Press this button to display next selection in UPS setting mode. |
| ON/Mute + Select Button | ➢ Switch to bypass mode: When the main power is normal, press ON/Mute and Select buttons simultaneously for 5 seconds. Then UPS will enter to bypass mode. This action will be ineffective when the input voltage is out of acceptable range. |

## 3-2. LCD Panel



| Display | Function |
|---|---|
| Backup time information | |
| | Indicates the remaining backup time in pie chart. |
| | Indicates the remaining backup time in numbers.<br>H: hours, M: minute, S: second |
| Fault information | |
| | Indicates that the warning and fault occurs. |
| | Indicates the warning and fault codes, and the codes are listed in details in 3-5 section. |
| Mute operation | |
| | Indicates that the UPS alarm is disabled. |
| Output & Battery voltage information | |
| | Indicates the output voltage, frequency or battery voltage.<br>Vac: output voltage, Vdc: battery voltage, Hz: frequency |
| Load information | |
|  | Indicates the load level by 0-25%, 26-50%, 51-75%, and 76-100%. |
| | Indicates overload. |
| | Indicates the load or the UPS output is short circuit. |
| Mode operation information | |
| | Indicates the UPS connects to the mains. |
| | Indicates the battery is working. |
| | Indicates the bypass circuit is working. |
| | Indicates the ECO mode is enabled. |
| | Indicates the Inverter circuit is working. |
| | Indicates the output is working. |
| Battery information | |
|  | Indicates the Battery level by 0-25%, 26-50%, 51-75%, and 76-100%. |
| | Indicates the battery is fault. |
| | Indicates low battery level and low battery voltage. |
| Input & Battery voltage information | |
| | Indicates the input voltage or frequency or battery voltage.<br>Vac: Input voltage, Vdc: battery voltage, Hz: input frequency |

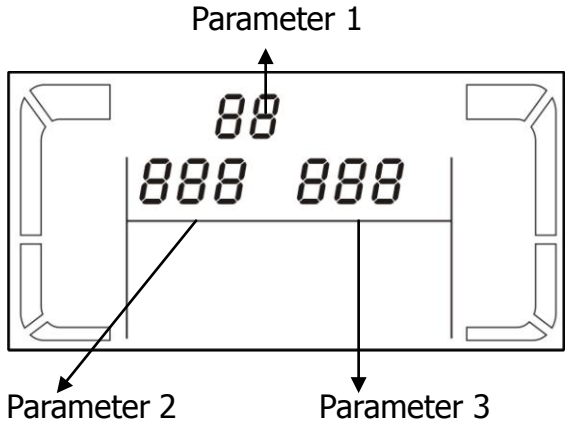
### 3-3. Audible Alarm

| | |
|---|---|
| Battery Mode | Sounding every 4 seconds |
| Low Battery | Sounding every second |
| Overload | Sounding twice every second |
| Fault | Continuously sounding |
| Bypass Mode | Sounding every 10 seconds |

### 3-4. LCD display wordings index

| Abbreviation | Display content | Meaning |
|---|---|---|
| ENA | ENA | Enable |
| DIS | dIS | Disable |
| ESC | ESC | Escape |
| HLS | HLS | High loss |
| LLS | LLS | Low loss |
| BAT | bAt | Battery |
| TP | tP | Temperature |
| CH | CH | Charger |

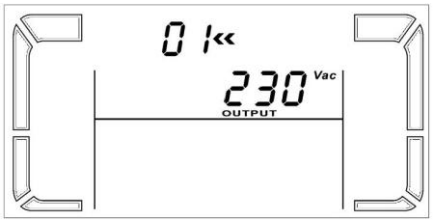
### 3-5. UPS Setting




There are three parameters to set up the UPS.

Parameter 1: It's for program alternatives. There are 6 programs to set up. Refer to below table.
Parameter 2 and parameter 3 are the setting options or values for each program.

- **01: Output voltage setting**

| Interface | Setting |
|---|---|
|  | **Parameter 3: Output voltage**<br>For 208/220/230/240 VAC models, you may choose the following output voltage:<br>**208:** presents output voltage is 208Vac<br>**220:** presents output voltage is 220Vac<br>**230:** presents output voltage is 230Vac<br>**240:** presents output voltage is 240Vac<br>For 104/110/115/120 VAC models, you may choose the following output voltage:<br>**104:** presents output voltage is 104Vac<br>**110:** presents output voltage is 110Vac<br>**115:** presents output voltage is 115Vac<br>**120:** presents output voltage is 120Vac |

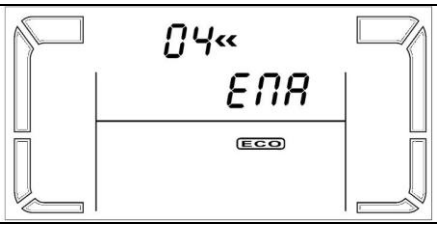
- **02: Converter mode enable/disable**

| Interface | Setting |
|---|---|
| | **Parameter 2 & 3:** Enable or disable converter mode. You may choose the following two options:<br>**CF ENA:** converter mode is enabled<br>**CF DIS:** converter mode is disabled |

- **03: Output frequency setting**

| Interface | Setting |
|---|---|
| | **Parameter 2 & 3: Output frequency setting.**<br>You may set the initial frequency in battery mode:<br>**BAT 50:** output frequency is set in 50Hz<br>**BAT 60:** output frequency is set in 60Hz<br>If converter mode is enabled, you may choose the following output frequency:<br>**CF 50:** output frequency is set in 50Hz<br>**CF 60:** output frequency is set in 60Hz |

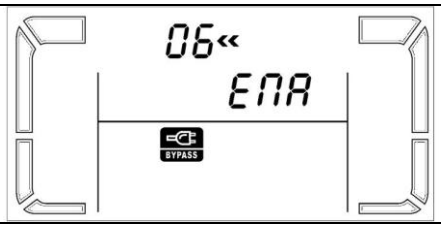
- **04: ECO mode enable/disable**

| Interface | Setting |
|---|---|
|  | **Parameter 3:** Enable or disable ECO function. You may choose the following two options:<br>**ENA:** ECO mode is enabled<br>**DIS:** ECO mode is disabled |

- **05: ECO voltage range setting**

| Interface | Setting |
|---|---|
| | **Parameter 2 & 3:** Set the acceptable high voltage point and low voltage point for ECO mode by pressing Down key or Up key.<br>**HLS:** High loss voltage in ECO mode in parameter 2.<br>The setting range in parameter 3 is from +7V to +24V of the nominal voltage.<br>**LLS:** Low loss voltage in ECO mode in parameter 2.<br>The setting range in parameter 3 is from -7V to -24V of the nominal voltage. |

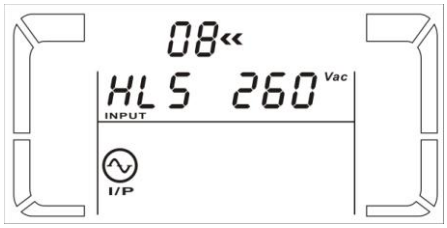
- **06: Bypass function enable/disable when UPS is off**

| Interface | Setting |
|---|---|
|  | **Parameter 3:** Enable or disable Bypass function. You may choose the following two options:<br>**ENA:** Bypass enable<br>**DIS:** Bypass disable |

- **07: Bypass voltage range setting**

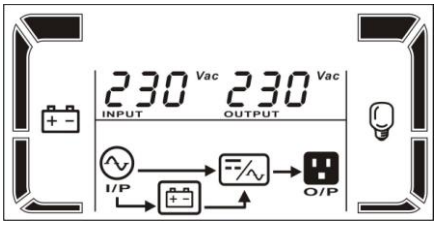
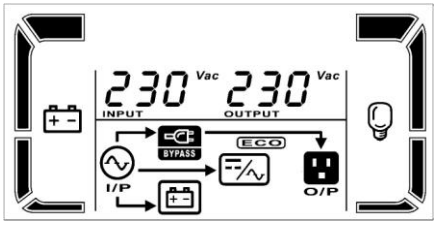
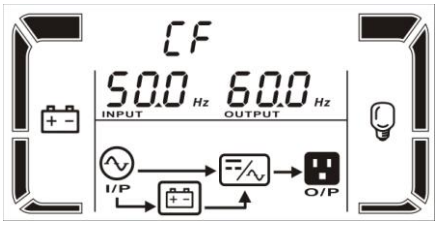
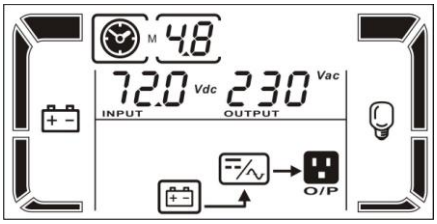
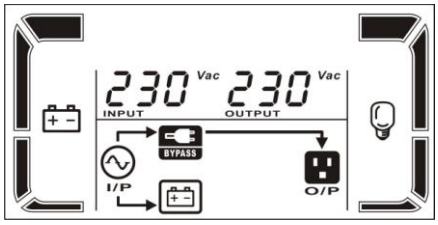
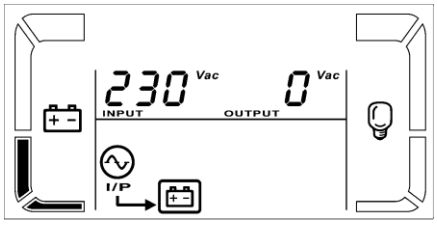
| Interface | Setting |
|---|---|
| | **Parameter 2 & 3:** Set the acceptable high voltage point and acceptable low voltage point for Bypass mode by pressing the Down key or Up key.<br>**HLS:** Bypass high voltage point:<br>**230-264:** setting the high voltage point in parameter 3 from 230Vac to 264Vac.<br>**LLS:** Bypass low voltage point:<br>**187-220:** setting the low voltage point in parameter 3 from 187Vac to 220Vac |

- **08: Input voltage range setting**

| Interface | Setting |
|---|---|
|  | **Parameter 2 & 3:** Set the acceptable input voltage range for AC mode by pressing the Down key or Up key.<br>**HLS:** Acceptable maximum input voltage point:<br>**280/270/260:** selecting 280Vac, 270Vac, or 260Vac as the maximum input voltage point in parameter 3.<br>**LLS:** Acceptable minimum input voltage point:<br>**175/185/195:** selecting 175Vac, 185Vac, or 195Vac as the minimum input voltage point in parameter 3. |

- **00: Exit setting**

## 3-6. Operating Mode Description

| Operating mode | Description | LCD display |
|---|---|---|
| Online mode | When the input voltage is within acceptable range, UPS will provide pure and stable AC power to output. The UPS will also charge the battery at online mode. |  |
| ECO mode | Energy saving mode:<br>When the input voltage is within voltage regulation range, UPS will bypass voltage to output for energy saving. |  |
| Converter mode | When input frequency is within 40 Hz to 70 Hz, the UPS can be set at a constant output frequency, 50 Hz or 60 Hz. The UPS will still charge battery under this mode. |  |
| Battery mode | When the input voltage is beyond the acceptable range or power failure and alarm is sounding every 4 second, UPS will backup power from battery. |  |
| Bypass mode | When input voltage is within acceptable range but UPS is overload, UPS will enter bypass mode or bypass mode can be set by front panel. Alarm is sounding every 10 second. |  |
| Standby mode | UPS is powered off and no output supply power, but still can charge batteries. |  |

## 3-7. Faults Reference Code

| Fault event | Fault code | Icon | Fault event | Fault code | Icon |
|---|---|---|---|---|---|
| Bus start fail | 01 | x | Inverter voltage Low | 13 | x |
| Bus over | 02 | x | Inverter output short | 14 | SHORT |
| Bus under | 03 | x | Battery voltage too high | 27 | BATT. FAULT |
| Bus unbalance | 04 | x | Battery voltage too low | 28 | BATT. FAULT |
| Inverter soft start fail | 11 | x | Over temperature | 41 | x |
| Inverter voltage high | 12 | x | Over load | 43 | OVER LOAD |

### 3-8. Warning indicator

| Warning | Icon (flashing) | Alarm |
|---|---|---|
| Low Battery | ⚠ LOW BATT. | Sounding every second |
| Overload | ⚠ OVER LOAD | Sounding twice every second |
| Battery is not connected | ⚠ | Sounding every second |
| Over Charge | ⚠ | Sounding every second |
| Site wiring fault | ⚠ I/P | Sounding every second |
| Over temperature | tP ⚠ | Sounding every second |
| Charger failure | CH ⚠ | Sounding every second |
| Out of bypass voltage range | ⚠ BYPASS | Sounding every second |

## 4. Troubleshooting

If the UPS system does not operate correctly, please solve the problem by using the table below.

| Symptom | Possible cause | Remedy |
|---|---|---|
| No indication and alarm even though the mains is normal. | The AC input power is not connected well. | Check if input power cord firmly connected to the mains. |
| | The AC input is connected to the UPS output. | Plug AC input power cord to AC input correctly. |
| The icon ⚠ and I/P flashing on LCD display and alarm is sounding every second. | Line and neutral conductors of UPS input are reversed. | Rotate mains power socket by 180° and then connect to UPS system. |
| The icon ⚠ and 🔋 flashing on LCD display and alarm is sounding every second. | The external or internal battery is incorrectly connected. | Check if all batteries are connected well. |
| Fault code is shown as 27 and the icon BATT. FAULT is lighting on LCD display and alarm is continuously sounding. | Battery voltage is too high or the charger is fault. | Contact your dealer. |
| Fault code is shown as 28 and the icon BATT. FAULT is lighting on LCD display and alarm is continuously sounding. | Battery voltage is too low or the charger is fault. | Contact your dealer. |
| The icon ⚠ and OVER LOAD is flashing on LCD display and alarm is sounding twice every second. | UPS is overload | Remove excess loads from UPS output. |
| | UPS is overloaded. Devices connected to the UPS are fed directly by the electrical network via the Bypass. | Remove excess loads from UPS output. |
| | After repetitive overloads, the UPS is locked in the Bypass mode. Connected devices are fed directly by the mains. | Remove excess loads from UPS output first. Then shut down the UPS and restart it. |
| Fault code is shown as 43 and The icon OVER LOAD is lighting on LCD display and alarm is continuously sounding. | The UPS shut down automatically because of overload at the UPS output. | Remove excess loads from UPS output and restart it. |
| Fault code is shown as 14 and the icon SHORT is lighting on LCD display and alarm is continuously sounding. | The UPS shut down automatically because short circuit occurs on the UPS output. | Check output wiring and if connected devices are in short circuit status. |

| Symptom | Possible cause | Remedy |
|---|---|---|
| Fault code is shown as 1, 2, 3, 4, 11, 12, 13 and 41 on LCD display and alarm is continuously sounding. | A UPS internal fault has occurred. There are two possible results:<br>1. The load is still supplied, but directly from AC power via bypass.<br>2. The load is no longer supplied by power. | Contact your dealer |
| Battery backup time is shorter than nominal value | Batteries are not fully charged | Charge the batteries for at least 5 hours and then check capacity. If the problem still persists, consult your dealer. |
| | Batteries defect | Contact your dealer to replace the battery. |

# 5. Storage and Maintenance

## Operation

The UPS system contains no user-serviceable parts. If the battery service life (3~5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced. In this case, please contact your dealer.

Be sure to deliver the spent battery to a recycling facility or ship it to your dealer in the replacement battery packing material.

## Storage

Before storing, charge the UPS 5 hours. Store the UPS covered and upright in a cool, dry location. During storage, recharge the battery in accordance with the following table:

| Storage Temperature | Recharge Frequency | Charging Duration |
|---|---|---|
| -25°C - 40°C | Every 3 months | 1-2 hours |
| 40°C - 45°C | Every 2 months | 1-2 hours |

# 6. Specifications

| **MODEL** | | **5K** | **5KISO** | **6K** | **6KR** |
|---|---|---|---|---|---|
| **ISOLATION TRANSFORMER** | | X | V | X | X |
| **CAPACITY** | | 5000VA/4000W | | 6000VA/4200W | |
| **INPUT** | | | | | |
| Voltage Range | Low Line Transfer | 175 VAC / 150 VAC / 130 VAC / 110 VAC ± 5 %<br>( based on load percentage 100%-80% / 80% - 70% / 70%- 60% / 60% - 0) | | | |
| | Low Line Comeback | 183 VAC / 158 VAC / 138 VAC / 118 VAC ± 5 %<br>( based on load percentage 100%-80% / 80% - 70% / 70%- 60% / 60% - 0) | | | |
| | Low Line Comeback (Auto restart) | 183VAC ± 5 % (80%~100% Load)<br>158VAC ± 5 % ( 0%~ 80% Load) | | | |
| | High Line Transfer | 280 VAC ± 5 % | | | |
| | High Line Comeback | 270 VAC ± 5 % | | | |
| Frequency Range | | 40Hz ~ 70 Hz | | | |
| Phase | | Single phase with ground | | | |
| Power Factor | | ≧ 0.95 | | | |
| **OUTPUT** | | | | | |
| Output voltage | | 208/220/230/240VAC | | | |
| AC Voltage Regulation (Batt. Mode) | | ± 3% | | | |
| Frequency Range (Synchronized Range) | | 47~53 Hz or 57 ~ 63 Hz | | | |
| Frequency Range (Batt. Mode) | | 50 Hz ± 0.25 Hz or 60Hz ± 0.3 Hz | | | |
| Overload | | 100%-110%: 10 Minutes, sounding every 0.5 seconds<br>110%-130%: 30 Seconds, sounding every 0.5 seconds<br>>130% : 1.5 Seconds, sounding every 0.5 seconds | | | |
| Current Crest Ratio | | 3:1 | | | |
| Harmonic Distortion | | ≦ 3 % THD (Linear Load)<br>≦ 6 % THD (Non-linear Load) | | | |
| Transfer Time | AC Mode to Batt. Mode | Zero | | | |
| | Inverter to Bypass | 4 ms (Typical) | | | |
| Waveform (Batt. Mode) | | Pure Sinewave | | | |
| **PEAK EFFICIENCY** | | | | | |
| AC Mode | | 90% | 85% | 90% | |
| Battery Mode | | 89% | 83% | 85% | |
| **BATTERY** | | | | | |
| Standard Model | Battery Type | 12V/10AH | | | |
| | Numbers | 8 | | | |
| | Recharge Time (Typical) | 8 hours recover to 90% capacity | | | |
| | Charging Current | 1A | | | |
| | Boost Voltage | 113.3V ± 1% | | | |
| | Floating Voltage | 109.4 ± 1% | | | |
| Long-run Model | Battery Type & Numbers | Depending on the capacity of external batteries | | | |
| | Charging Current | 4A/8A, 10A (option) | | | |
| | Boost Voltage | 113.3V ± 1% | | | |
| | Floating Voltage | 109.4 ± 1% | | | |
| **PHYSICAL** | | | | | |
| Standard Model | Dimension, D X W X H | 426 X 190 X 318 | 426 X 190 X 448 | 426 X 190 X 318 | UPS Unit: 480 x 438 x 88<br>Battery Pack: 480 x 438 x 88 |
| | Net Weight (kgs) | 35.3 | 62.5 | 35.3 | UPS Unit: 12.6<br>Battery Pack: 42.3 |
| Long-run Model | Dimension, D X W X H | 426 X 190 X 318 | 426 X 190 X 448 | 426 X 190 X 318 | 480 x 438 x 88 |
| | Net Weight (kgs) | 14.3 | 41.5 | 14.3 | 12.6 |
| **ENVIRONMENT** | | | | | |
| Operation Humidity | | 0-95 % RH @ 0- 40°C (non-condensing) | | | |
| Noise Level | | Less than 55dBA @ 1 Meter | | | |
| **MANAGEMENT** | | | | | |
| Optional RS-232 or USB | | Supports Windows 2000/2003/XP/Vista/2008/XP/7, Linux, Unix, and MAC | | | |
| Optional SNMP | | Power management from SNMP manager and web browser | | | |

* Derate capacity to 60% of capacity in Frequency converter mode and to 80% when the output voltage is adjusted to 208VAC (104VAC).